US005818814A

United States Patent [19]

Testani et al.

[11] Patent Number: 5,818,814

[45] Date of Patent: Oct. 6, 1998

[54] METHOD AND APPARATUS FOR SYNCHRONIZING AND CONTROLLING REMOTE RECEIVER

[75] Inventors: **Alan John Testani**, Boca Raton, Fla.; **Eugene Arnold Eighmy**, Hoover; **William Thomas Edwards**, Helena, both of Ala.

[73] Assignee: **Sonics Associates, Inc.**, Birmingham, Ala.

[21] Appl. No.: **738,227**

[22] Filed: **Oct. 25, 1996**

[51] **Int. Cl.**[6] **H04J 3/06**

[52] **U.S. Cl.** **370/212**; 370/328; 370/503; 375/238; 375/356; 455/443; 455/502

[58] **Field of Search** 370/328, 331, 370/332, 212, 503; 455/422, 434, 436, 437, 439, 443, 39, 67.1, 68, 70, 502, 503; 381/77, 78, 79; 375/238, 316, 356

[56] **References Cited**

U.S. PATENT DOCUMENTS

4,327,441	4/1982	Bradshaw	375/238
4,457,019	6/1984	Szabo, Jr. et al.	381/79
5,392,331	2/1995	Patsiokas et al.	455/436
5,517,675	5/1996	O'Connor et al.	455/437
5,615,228	3/1997	Soenen	375/238

Primary Examiner—Chi H. Pham
Assistant Examiner—Ricky Q. Ngo
Attorney, Agent, or Firm—Gregory M. Howison

[57] **ABSTRACT**

A user headset is provided that is operable to contain an audio device (**50**) and a receiver (**52**). The receiver (**52**) is operable to receive both audio information on multiple channels and also data. The data is received in the form of pulse width modulated sync signals. The sync signals are operable to provide a synchronization signal for 3-D liquid crystal lenses (**60**). The data is encoded within the sync signal through pulse width modulation. The width of the pulse defines various commands. These various commands define the channel over which the audio is to be transmitted. These channels can either be user-defined or they can be a function of the transmitter. The transmitter includes an audio generator (**42**) for generating audio signals on multiple channels and also a data generator (**40**). These are modulated onto a broad band optical signal and transmitted via an IR data link. The system facilitates a walking tour by transmitting commands to the receiver that allow the receiver to lock onto a particular channel, there being select channels for a given zone. When walking from one zone to another zone, different channels in the next zone are automatically detected. The system detects the crossing of a boundary between zones by a change in sync frequency. Since the sync signals for both zones are synchronized, this facilitates a seamless transfer between adjacent zones. The synchronization is provided by transmitting a pulse stream at different frequencies with the command information encoded within the pulses by pulse-width modulation. The frequencies are harmonics of a fundamental frequency, such that the higher frequency merely adds a pulse to the pulse stream. By selecting the smallest pulse width, the highest priority transmitter can have information extracted therefrom.

8 Claims, 22 Drawing Sheets